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(54) Title: EPSTEIN-BARR VIRUS-SPECIFIC IMMUNIZATION

(57) Abstract: The invention provides materials and methods for using EBV EBNA2 peptide epitopes to treat and/or prevent post-transplant lymphoproliferative disorders (PTLD). The invention also provides compositions and articles of manufacture containing EBNA2 peptide epitopes that can be used to treat and/or prevent PTLD.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/18688

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : A61K 39/00
US CL : 424/185.1
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/185.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KHANNA et al. Class I Processing-Defective Burkitt's Lymphoma Cells Are recognized Efficiently by CD4 EBV-Specifc CTLs. The Journal of Immunology. 15 April 1997, Vol. 158, No. 8, pages 3619-3625, see the entire document, especially, page 3621, right column.	1-52
Y	FINBERG R. W. Epstein-Barr virus-specific T cells for the management of Epstein-Barr virus lymphomas. Current Opinion Oncology. September 2001, Vol. 13, pages 349-353, see the abstract.	1-52

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier document published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 SEPTEMBER 2003	02 AUG 2004

Name and mailing address of the ISA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	A. R. SALIMI
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Form PCT/ISA/210 (second sheet) (July 1998)☆

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/18682

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/18682

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KHANNA et al. Targeting Epstein-Barr virus nuclear antigen 1 (EBNA1) through the class II pathway resores immune recognition by EBNA1-specifc cytotoxic T lymphocytes:evidence for HLA-DM-independent. International Immunology. October 1997, Vol. 9, No. 10, pages 1537-1543, see the abstract.	1-52
Y	THOMSON et al. Targeting a Polyepitopic protein Incorporating Multiple Class II-Restricted Viral Epitopes to the Secretory/Endocytic Pathway Facilitates Immune Recognition by CD4 Cytotoxic T Lymphocytes: a Novel Approach to Vaccine Design. Journal of Virology. March 1998, Vol. 72, No. 3, pages 2246-2252, see the abstract.	1-52
Y	SOUTHWOOD et al. Several Common HLA-DR Types Share Largely Overlapping Peptide Binding Repertoires. The Journal of Immunology. 1998, Vol. 160, pages 3363-3373, see the abstract.	1-52
Y	NIKIFOROW et al. CD4 T-Cell Effectors Inhibit Epstein-Barr Virus-Induced B-cell Proliferation. Journal of Virology. April 2001, Vol. 75, No. 8, pages 3740-3752, see the abstract.	1-52
Y	KHANNA et al. Activation and adoptive transfer of Epstein-Barr virus-specific cytotoxic T cells in solid organ transplant patient with posttransplant lymphoproliferative disease. Proc. Natl. Acad. Sci., USA. August 1999, Vol. 96, pages 10391-10396, see the entire document.	1-52
Y	US 5,662,907 A (KUBO et al) 02 September 1997, see the claims.	1-52
Y	US 5,869,453 A (MOSS et al) 09 February 1999, see the claims.	1-52
Y	WO 95/24925 A1 (THE COUNCIL OF THE QUEENSLAND INSTITUTE OF MEDICAL RESEARCH) 21 September 1995, see the abstract.	1-52

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/18682

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

WEST, MEDLINE, CAPLUS, DREWENT, EPA, JPA, NPL

Search terms: EBV, Epstein-Barr virus, transplant, immune response, HLA-DR1